

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of)	
)	
Fixed Wireless Communications Coalition, Inc., Request)	RM-11778
for Modified Coordination Procedures in Bands Shared)	
Between the Fixed Service and the Fixed Satellite)	
Service)	

SUPPORT OF NOKIA

Nokia respectfully submits comments in Support of the Fixed Wireless Communications Coalition’s (“FWCC’s”) Petition for Rulemaking (“Petition”) in this proceeding.¹ Nokia requests that Commission seek comment on the FWCC’s proposal, and also explore additional measures in the Rulemaking that would facilitate greater terrestrial use of the 3.7-4.2 GHz band while protecting incumbent services.

I. GRANT OF FWCC’s PROPOSAL WOULD ENABLE MORE INTENSIVE SPECTRUM USE

FWCC’s Petition identifies a problem in the 3.7-4.2 GHz band and other bands shared between the Fixed Service (“FS”) and the Fixed Satellite Service (“FSS”). Specifically, under the current practice of full-band, full-arc coordination, “[w]hen an FSS licensee coordinates frequencies and directions it has no use for, valuable spectrum remains idle, even if needed by FS operators.”² FWCC further correctly states that, “In the 3.7-4.2 band, registered earth stations are so numerous as to make any FS coordination impossible in most of the country.

¹ Fixed Wireless Communications Coalition, Inc., Petition for Rulemaking, RM-11778, filed Oct. 11, 2016 (“Petition”).

² Petition at 1.

Yet many of those earth stations each access just one transponder on one satellite.”³ Nokia therefore supports the FWCC’s Petition.

In particular, we support the proposal to license FSS stations for the frequency, azimuth and elevation that they use as is the requirement for terrestrial FS. The U.S. should discontinue granting satellite operators the right to force valuable spectrum, which they never intend to use, to lay fallow. Indeed, adoption of the FWCC proposal would simply even the playing field for coordination between FSS and FS – co-equal services. Further, grant of the rule change would harmonize U.S. FSS licensing practices with those in other countries like Canada, which, in Nokia’s experience, do not afford FSS such broad coordination privileges.

Nokia also supports the concept of construction certification for earth stations. Nokia’s preliminary investigation has determined that a large percentage of licensed earth stations do not actually exist, or violate the rules by existing far from their licensed location.⁴ Requirements to build within a specified time period at the licensed location are standard for other frequency users and should be applied equally here.

II. THE RULEMAKING SHOULD CONSIDER ADDITIONAL STEPS TO ENABLE MORE INNOVATIVE USE OF 3.7-4.2GHZ, WHILE PROTECTING INCUMBENT FS AND FSS

As noted above, FS and FSS have a co-primary allocation in 3.7-4.2 GHz. FS operates under Part 101 (Fixed Microwave Services) and consists of traditional point-to-point microwave links which have to coordinate with thousands of FSS earth stations.⁵ There are new applications for FS currently being investigated. One such fixed wireless application that Nokia is testing in real-world environments with its partners is for extreme broadband in which

³ *Id.* at 5.

⁴ *See, e.g.*, Letter from Andrew Kreig, Co-Chair, FWCC to Marelene Dortch, Secretary, FCC (filed Sept. 30, 2016) .

⁵ *See* 47 C.F.R. § 101.103.

traditionally wired broadband access to residential and commercial buildings is, instead, provided wirelessly. Fixed wireless service can become an alternative to fiber to the home to speed up deployments for last-mile broadband delivery.⁶ While Nokia commends the Commission on its efforts to unlock the mmWave spectrum range for wireless broadband services, we continue to urge the Commission to also investigate mid-band (6 GHz to 24 GHz) and low-band (below 6 GHz) spectrum as critical pieces to the future of wireless networks. Indeed, different propagation characteristics at different frequency ranges can be appropriate for different use cases.⁷

The 3.7-4.2 GHz range has strong potential for innovative wireless applications for several reasons:

- ***Favorable propagation characteristics:*** The 3.7-4.2 GHz band has similar propagation characteristics (and need for protection of FSS incumbents) as 3.55-3.7 GHz (3.5 GHz band), which the Commission already has allocated for wireless broadband applications.⁸ As the Commission rightfully explained in the 3.5 GHz NPRM:

The 3.5 GHz Band, considered purely from a radio propagation standpoint, holds great potential for small cell applications. Small cell use could turn some of the perceived disadvantages of the band into advantages. Small cell deployments inherently require less range to meet users' needs than macrocell networks. Moreover, limited signal propagation can facilitate dense deployment of small cells with a reduced risk of harmful interference to geographically or spectrally adjacent users, greatly increasing frequency reuse and available network capacity. On the other hand, the signal propagation at 3.5 GHz is still viable for non-line-of-site use, allowing for flexible network topologies. In

⁶ See, e.g., Verizon and Nokia conduct live 5G pre-commercial trial in Dallas-Fort Worth #MWC16, available at http://www.nokia.com/en_int/news/releases/2016/02/22/verizon-and-nokia-conduct-live-5g-pre-commercial-trial-in-dallas-fort-worth-mwc16.

⁷ See, e.g., Comments of Nokia, GN Docket No. 14-177 *et al.*, at 13, filed Jan. 27, 2016.

⁸ Report and Order and Second Further Notice of Proposed Rulemaking, adopted April 17, 2015, FCC 15-47.

short, given the characteristics of the band, the 3.5 GHz Band appears to be a good candidate for small cell uses.⁹

- ***Adjacent to terrestrial use at 3.55-3.7 GHz range.*** The 3.7-4.2 GHz range is just above the 3.55-3.7 GHz range and, when combined, can provide 650 MHz of contiguous spectrum in the 3.5 GHz range that could enable extreme broadband delivery.
- ***Global harmonization.*** The 3.55-4.2 GHz range, which combines the 3.5 GHz and 3.7-4.2 GHz bands, is also being considered in other regions and countries for 5G and has a potential to become a globally harmonized range. This holds true even if different parts of that range are available in different countries. For instance, on September 14, 2016, the European Commission published its 5G action plan which mentions that the “3.5 GHz band seems to offer high potential to become a strategic band for 5G launch in Europe.”¹⁰ The 3.5 GHz and 4 GHz ranges are also being considered in Japan and China.¹¹ Spectrum harmonization helps to achieve economies of scale, enables global roaming, reduces equipment design complexity and improves spectrum efficiency.¹² All of this ultimately reduces costs for consumers. In particular, device costs are a significant issue as widely supported spectrum bands and channels can lower the crucial radio frequency (RF) component costs. Harmonization also aids in addressing cross border coordination.

⁹ ¶20, *Amendment of the Commission’s Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, GN Docket No. 12-354, Notice of Proposed Rulemaking, FCC 12-148 (rel. Dec. 12, 2012).

¹⁰ See 5g for Europe, Communication from the Commission to the European Parliament, The Council, The European Economic and Social Committee and the Committee of the Regions, *5G for Europe: An Action Plan*, Sept. 16, 2016, available at <https://ec.europa.eu/transparency/regdoc/rep/1/2016/EN/1-2016-588-EN-F1-1.PDF>.

¹¹ See *Asia gets busy with latest 5G projects in Japan and China*, Mobile Europe, Nov. 9, 2016, available at <http://www.mobileeurope.co.uk/press-wire/asia-gets-busy-with-latest-5g-projects-in-japan-and-china>.

¹² See Document 5D/246-E, Canada’s input to ITU-R WP 5D, “Technical perspective on benefits of spectrum harmonization for mobile services and IMT,” 23 January 2013.

Nokia is part of a chorus of voices that agree exploration of this band would serve the public interest. For example, the Commission’s Technological Advisory Council (TAC) FCC Advanced Sharing Working Group recommended that the Commission consider 3.7-4.2 GHz for future sharing.¹³ Just like the Commission’s “Spectrum Frontiers” proceeding fulfills a TAC recommendation for exploring high-band spectrum, the Commission could initiate a rulemaking to act on TAC’s recommendation to study 3.7-4.2GHz for wireless broadband provision. There is also support for legislation promoting the 3 GHz range. In particular, the MOBILE NOW Act, which seeks out new spectrum resources below the 6 GHz band for commercial use, includes mandates to study the potential of the 3.1-3.5 GHz and 3.7-4.2 GHz bands. Senator John Thune, Chairman of the Senate Committee on Commerce, Science and Transportation demonstrated his commitment to MOBILE NOW (S.19) by re-introducing the bill on January 3, 2017, the very first day of the new Congress.

The Commission should study how to enable more productive commercial use of spectrum like 3.7-4.2 GHz through innovative applications, as discussed above. As spectrum is expected to be shared between these new applications and incumbent FS and FSS in 3.7-4.2GHz, the best sharing framework needs to be studied in order for these new applications to thrive while incumbent FS and FSS can be protected and also expand. The protection of incumbents operating in the band should be based on real-world conditions and actual use, consistent with the regulatory framework governing 3.5 GHz.¹⁴ It is important to adequately protect the incumbents without unnecessarily constraining the development of the new systems, which is why interference criteria should not be based on worst-case assumptions but rather on real world

¹³ See Technical Advisory Council, Federal Communications Commission, Summary of Meeting, Sept. 23, 2014, available at <https://transition.fcc.gov/bureaus/oet/tac/tacdocs/meeting92314/TACMeetingSummary9-23-14.pdf>.

¹⁴ *Amendment of the Commission’s Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, Order on Reconsideration and Second Report and Order, GN Docket No. 12-354, 31 FCC Rcd 5011 (2016).

operational parameters and conditions. For these reasons, Nokia recommends that the Commission explore how to increase the commercial use of the 3.7-4.2 GHz through innovative use as part of this proposed Rulemaking proceeding.

III. CONCLUSION

As discussed above, Nokia supports the FWCC's Petition for Rulemaking to enable more intensive use of current commercial spectrum across multiple bands such as 3.7–4.2 GHz, 5.925–6.425 GHz, 10.7–11.7 GHz and 12.7–13.25 GHz. Nokia further urges that the proposed Rulemaking consider changes to the Commission's rules that would enable more innovative use of the 3.7-4.2 GHz band.

Respectfully submitted,

Nokia

/Jeffrey Marks/

Jeffrey Marks

Government Relations

Prakash Moorut
Nokia Bell Labs

Nokia
1100 New York Avenue, NW
Suite 705 West
Washington, DC 20005

January 9, 2017